Frequently Asked Questions about the Bolsa Chica Ecological Risk Assessment

♦ What is an Ecological Risk Assessment?

An Ecological Risk Assessment (ERA) is a process that evaluates the likelihood that adverse ecological effects are occurring or may occur as a result of exposure of fish or wildlife to environmental contaminants or pollutants.

What types of questions is the ERA designed to answer?

- What contaminants are present at the Bolsa Chica site?
- How are the birds and other wildlife that use the Bolsa Chica site as habitat exposed to the contaminants?
- How will the contaminants affect the quality of habitat for fish and/or wildlife using the site in the future?
- How dangerous is the exposure to wildlife health?
- What contaminant concentrations are safe for wildlife?

♦ What is the Bolsa Chica Steering Committee?

The Bolsa Chica Steering Committee is comprised of four Federal and four State agencies that are overseeing the restoration project at Bolsa Chica. The restoration project is being funded by the Ports of Los Angeles and Long Beach as part of a wetlands mitigation program. Steering Committee member agencies include: the U.S. Environmental Protection Agency, National Marine Fisheries Service, U.S. Army Corps of Engineers, U.S. Fish and Wildlife Service, California Department of Fish and Game, State Coastal Conservancy, California Resources Agency, and State Lands Commission.

♦ Why was an ERA done at Bolsa Chica?

An ERA was conducted because there was evidence that historical activities on the site had introduced pollutants that may still be present in the sediments and soils. The ERA provides an understanding about what pollutants are present at the site and in what concentrations, and whether those pollutants and concentrations could have an adverse effect on fish and wildlife if they were to remain in place.

♦ How will the ERA be used?

The Bolsa Chica Steering Committee will use the ERA and other available information to plan strategies to reduce the risk of possible adverse impacts to wildlife by limiting or stopping

exposure of wildlife to those contaminants that pose an unacceptable risk. Although this risk reduction may include the removal of contaminants or the cleaning of soil, these are not the only potential solutions. It may be appropriate to sequester or cap portions of the site to prevent exposure of wildlife to contaminants. The Steering Committee will seek solutions that will make the site safe for both current and expected future uses. Completion of the ERA is one step of a multi-step process leading to restoration of fish and wildlife habitats that are free of significant contamination.

♦ What work has been done to prepare this ERA?

Many agencies and organizations worked together on the following tasks:

- **Analyze Contamination (1996 to 2000)**
  - We sampled soils and sediments at the site. Over 1000 sediment cores were collected from the 1200-acre Bolsa Chica site
  - We sampled water at the site. Over 100 water samples were collected from the Bolsa Chica site.
  - We sampled wildlife and wildlife prey items at the site. Over 250 tissue samples were collected from the Bolsa Chica site including aquatic invertebrates, fish, terrestrial invertebrates, plants, bird eggs, and mice
  - We conducted contaminant analyses. Over 235 different contaminants or possible pollutants were evaluated.
  - We tested sediment and water samples by exposing aquatic invertebrates or fish in the laboratory to determine which contaminants caused toxic effects.
- **Estimate Exposure**

We evaluated how birds and other wildlife are exposed to contaminants, which is mainly by feeding on contaminated organisms or incidentally ingesting soil/sediment while feeding. In addition, we quantified wildlife exposure to contamination by these pathways.

- **Assess Potential Wildlife Health Dangers**

We evaluated how dangerous onsite concentrations of contaminants are to wildlife health by performing not only laboratory studies of site-specific conditions (bioassays and bioaccumulation), but also by reviewing other studies (literature surveys) that provide information about the contaminants that are found at the site.

- **Characterize Site Risk**

We linked our knowledge of onsite contaminants to potential adverse effects by integrating all the information we collected. This allowed us to establish a "weight-of-evidence" approach for assessing potential risk. The information we used included chemical presence and concentrations found on-site; results of site-specific toxicity bioassays and bioaccumulation studies; literature surveys; and the restoration plan for the site. This resulted in the typical outcomes of an ERA including risk estimation, risk description and uncertainty analysis.

♦ What were the findings of the ERA?

The ERA identified chemicals of ecological concern (COEC) on the site based on their presence, concentration, and risk of adverse effects to fish and wildlife or their food sources at the site. We used not only the contaminant data specifically collected on the site, but also models that evaluated the effects of each contaminant on various marine, freshwater aquatic and terrestrial wildlife or plant species that use the site now and are expected to use the site once it is restored. This process resulted in the identification of nearly 50 specific COECs that were found on the site. These contaminants were determined to be present in high enough concentrations to cause risk of adverse chronic or lethal impacts to plants, invertebrates, fish or wildlife.

♦ What is a "contaminant" and what sort of contamination has been found at Bolsa Chica?

A contaminant is a substance or compound that has the potential to be toxic. Contaminants are often thought of as chemicals that are not found naturally in an ecosystem and have the potential to cause harm to organisms or populations of organisms. There are also naturally occurring chemicals (such as copper, mercury, and selenium) that cause adverse effects when found at elevated levels in the environment. Wastes from a variety of sources that may cause harm to plants and animals are considered to be contaminants. In general, the words toxic and contaminant are used interchangeably, though the word "toxic" is more properly an adjective, and the word "contaminant" is a noun.

A wide variety of contaminants have been identified at the Bolsa Chica site. Metals and some petroleum hydrocarbons or petroleum products were found to frequently exceed toxic levels for aquatic organisms, plants, or wildlife in many areas of the Bolsa Chica site. Most contamination was found at or near the surface and was generally associated with the oil and gas exploration, production and processing activities that occurred on the site for many decades. The highest densities of COEC locations are in the Future Full Tidal area and in former oil field sumps.

The ERA indicates that contamination at the site poses a higher risk to aquatic wildlife (and their prey) than to terrestrial wildlife. The ERA also suggests that contamination in sediment and soil pose a greater risk than contamination in the water.

♦ How should the public interpret these results?

The ERA indicates that, of the 237 COECs evaluated in the ERA as potential sources of ecological risk, 188 are not present at levels that warrant further consideration. There are 49 COECs present at levels that warrant additional analysis and consideration for remediation. The information in the ERA, together with additional analysis, will be used to develop an overall remediation plan for the site, including clean-up criteria and clean-up plans. Due to the co-

location of contaminants and other factors, it is possible that clean-up criteria will not be needed for all 49 COECs. The ERA does not actually identify "clean-up goals" for specific contaminants, but the results of the ERA provide adequate information to evaluate the need for clean-up and appropriate levels of clean-up.

Without remediation or clean-up at the Bolsa Chica site, the adverse effects to plants and wildlife in certain areas of the site will remain high. Although the ERA identified 49 COECs that require further analysis and potential clean-up, those COECs are generally not present at levels that would cause the soils to be considered "hazardous waste" under State or Federal hazardous waste laws.

♦ How does the ERA relate to health of the Bolsa Chica ecosystem?

Understanding the behavior and effects of chemical contaminants found at Bolsa Chica presents a complex challenge. Some effects are readily apparent, while others are not. For example, reduced numbers of breeding birds or dead vegetation due to oil spills may be easily measured or seen. Other biological effects, however, are not so discernible. Researchers know that contaminants can affect organisms at cellular and molecular levels, with possible impacts on the reproductive or immune systems of wildlife. Contaminants can also affect wildlife species indirectly, by altering organisms lower down the food chain. Therefore, the remediation and clean-up of the Bolsa site will provide for opportunities for future generations of wildlife to find a healthy habitat for breeding, raising young, feeding or just resting along their migration route.

♦ Should I be concerned about health risks to my family?

Almost all of the levels of contamination found by our sampling are well below levels that would pose a risk to human health. Those few chemicals present at levels that may pose a human health and safety threat are in isolated locations and they will be addressed as part of the cleanup of the site. While the cleanup goals have not yet been set, fish and wildlife are generally more sensitive to contaminants than humans, so levels established to protect fish and wildlife are typically much more stringent than those required to protect human health. To ensure that the site will not pose an unacceptable risk to human health, the Steering Committee will separately evaluate the risk to human health to the extent any is present.

♦ What happens next?

Using the information from the ERA, together with additional analysis, the Steering Committee will establish cleanup goals for and delineate the COECs determined to be present at the Bolsa.

♦ How will cleanup levels be determined?

The Steering Committee will look at the results of the ERA and, weighing several other factors, will determine which contaminants will be cleaned up, where and to what degree cleanup should occur, and what soil concentrations are acceptable to remain on-site. For example, in certain high-value habitat areas that are not heavily impacted by contamination, the Steering Committee may decide that the habitat disruption that would result from cleanup may be outweighed by the need to conserve the habitat values that now exist.

♦ What is an ER-L, ER-M, LC20, LC50, or COEC?

These acronyms refer to reference toxicity values (RTV) that can be used to evaluate the degree of adverse effects to an organism that may be associated with certain concentrations of COECs in sediment. For the Bolsa Chica ERA, we relied on both literature-derived RTVs (stated as ER-L or ER-M), as well as those we determined specifically from laboratory studies that used sediments from Bolsa Chica (stated as LC20 or LC50).

Effects Range-Low (ER-L): Part of the Effects Range sediment quality guidelines, established by the National Oceanic and Atmospheric Administration. The guidelines were developed to identify concentrations of contaminants associated with biological effects in laboratory, field, or modeling studies. The ER-L value is the concentration equivalent to the lower tenth percentile of the compiled study data. Sediment concentrations below the ER-L are interpreted as being "rarely" associated with adverse effects.

Effects Range-Median (ER-M): Part of the Effects Range sediment quality guidelines established by the National Oceanic and Atmospheric Administration. The guidelines were developed to identify concentrations of contaminants associated with biological effects in laboratory, field, or modeling studies. The ER-M is the concentration equivalent to the fiftieth percentile of the compiled study data. Sediment concentrations above the ER-M are "frequently" associated with adverse effects. Concentrations between the ER-L and ER-M are typically considered to “sometimes” be associated with adverse effects.

LC20: The concentration of a contaminant that is lethal to 20 percent of the organisms in a laboratory bioassay. All LC20 values in the ERA are based on site-specific laboratory studies for this project.

LC50: The concentration of a contaminant that is lethal to 50 percent of the organisms in a laboratory bioassay. All LC50 values in the ERA are based on site-specific laboratory studies for this project.

COEC: Chemical of ecological concern. For purposes of the ERA, a chemical is designated as a COEC if it is present at the site at an exposure level that exceeds a reference toxicity value for that chemical?

♦ What will be done with materials at the site that pose an unacceptable risk?

A range of approaches will likely be used to address the materials at the site that pose an unacceptable risk. Options include treating soils onsite and reusing the clean soils as part of the restoration project, removing soils from the site and disposing of the soils in an appropriate landfill, or moving the soils from an area where they are exposed to fish and wildlife to an area where they will be permanently enclosed inside the constructed levees or nest sites. In addition, some contaminated material may be left in place because the habitat destruction associated with its removal would be greater than the harm to the ecosystem caused by leaving it where it is. The specific details can be resolved once cleanup goals are developed and the restoration project final design gets under way.

♦ How can I review the complete ERA?

The ERA document itself is voluminous and contains a very large amount of esoteric data. The Steering committee will provide the ERA to any requesting party at no charge on compact disk format that can be read and printed with most desktop computers. One printed copy will be placed at the Huntington Beach Central Library, 7111 Talbert, Huntington Beach, California.

Copies of the press release, Executive Summary of the ERA, and the Frequently Asked Questions may be found on the following websites:
State Lands Commission – http://www.slc.ca.gov
National Marine Fisheries Service - http://swr.ucsd.edu/hcd/bolsa.htm

To request a CD-ROM version of the complete ERA you may write to the following address:
Jack Fancher
Carlsbad Fish and Wildlife Office
2730 Loker Avenue West
Carlsbad, California 92008

Requests may also be placed by calling Jack Fancher at (760) 431-9440 ext. 215, or by submitting an electronic mail request to jack_fancher@fws.gov